



PATENT

Attorney Docket No.: SYNGEN-08259

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Gabriel Alvarado

Serial No.: 10/670,015

Group No.: 1637

Filed: 9/24/03

Examiner: Jezia Riley

Entitled: **Compositions and Method for the
Use of FMOC Derivatives in DNA/RNA Synthesis**

INFORMATION DISCLOSURE STATEMENT

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CERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.8(a)(1)(i)(A)

I hereby certify that this correspondence (along with any referred to as being attached or enclosed) is, on the date shown below, being deposited with the U.S. Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA. 22313-1450.

Dated: 4/12/2007

By: 

Christopher J. Collins

Sir or Madam:

The citations listed below, copies attached, may be material to the examination of the above-identified application, and are therefore submitted in compliance with the duty of disclosure defined in 37 C.F.R. §§ 1.56 and 1.97. The Examiner is requested to make these citations of official record in this application.

The following Patents are referred to in the body of the specification:

- U.S. Pat. Nos. 4,683,195 and 4,683,202 to Mullis *et al.*

The following articles are referred to in the body of the specification:

- Marmur and Lane, "Strand separation and specific recombination in deoxyribonucleic acid: biological studies," *Proc. Natl. Acad. Sci. USA* 46:453-461 (1960);
- Doty *et al.*, "Strand separation and specific recombination in deoxyribonucleic acid: physical chemical studies," *Proc. Natl. Acad. Sci. USA* 46:461-476 (1960);

- Wallace *et al.*, "Application of synthetic oligonucleotides to the diagnosis of human genetic diseases," *Biochimie* 67:755-762 (1985);
- Studencki and Wallace, *DNA* 3:1 (1984)¹; and
- Studencki *et al.*, *Human Genetics* 37:42 (1985)².

Applicants have become aware of the following printed publications that may be material to the examination of this application:

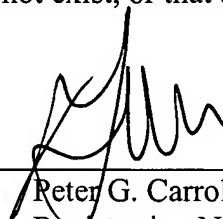
- Koole *et al.*, "Synthesis of phosphate-methylated DNA fragments using 9-fluorenylmethoxycarbonyl as transient base protection group," *J. Org. Chem.*, 54:1657-1664 (1989). This reference discloses the preparation of 4-N-(9-fluorenylmethoxycarbonyl)-2'-deoxycytidine, 6-N-(9-fluorenylmethoxycarbonyl)-2'-deoxyadenosine, and 2-N-(9-fluorenylmethoxycarbonyl)-2'-deoxyguanosine.
- Bergermann & Pfeleiderer, "The 2-dansylethoxycarbonyl (= 2-{[5-(dimethylamino)naphthalen-1-yl]sulfonyl}ethoxycarbonyl; Dnsceoc) group for protection of the 5'-hydroxy function in oligodeoxyribonucleotide synthesis," *Helvetica Chimica Acta* 77:203-2115 (1994). This reference discloses that the 2-Dansylethoxycarbonyl group can be cleaved with dilute 1,8-diazabicyclo[5.4.0]undec-7-ene (DBU).
- Gaur *et al.*, "Synthesis of 9-fluorenylmethoxycarbonyl (Fmoc) exocyclic amino protected deoxynucleosidephosphoramidites for oligonucleotide synthesis," *Indian Journal of Chemistry* 29B:108-112 (1990). This reference discloses the preparation of N⁴-(9-fluorenylmethoxycarbonyl)-2'-deoxycytidine and N⁶-(9-fluorenylmethoxycarbonyl)-2'-deoxyadenosine.
- Seela and Wenzel "Oligodeoxyribonucleotides containing 4-aminobenzimidazole in place of adenine: Solid-phase synthesis and base pairing," *Helvetica Chimica Acta* 78:833-846 (1995). This reference discloses an fmoc protected 4-aminobenzimidazole 2'-deoxyribofuranoside phosphoramidite that was used in automated solid phase synthesis of oligonucleotides.

¹ The applicant has not been able to locate this reference, if the examiner requests a copy we will try to obtain it.
² The applicant has not been able to locate this reference, if the examiner requests a copy we will try to obtain it.

- Manoharan et al., “Guanidinium Functionalized Oligonucleotides and Method/Synthesis” United States Patent Number 6,534,639 (filed July 2000). This reference discloses oligonucleotides that contain guanidinium groups attached to a solid support.
- Usman et al., “Synthesis, Deprotection, Analysis and Purification of RNA and Ribozymes” United States Patent Number 6,469,158 (filed May 1995). This reference discloses deprotection of exocyclic amino protecting groups of polymer bound oligonucleotides.
- Smith et al. “Nucleosides possessing blocked aliphatic amino acid groups”, United States Patent Number 5,015,733 (filed December 1988). This reference discloses oligonucleotides bound to a solid support that have been reacted with phosphoramidites.
- Smith et al. “Oligonucleotides possessing a primary amino group in the terminal nucleotide”, United States Patent Number 5,118,800 (filed February 1991). This reference discloses 5'-amino-5'-dexoythymidines having a nitrogen protecting group of 9-fluorenylmethyloxy carbonyl.
- Smith et al., “Deoxyribonucleoside phosphoramidites in which an aliphatic amino group is attached to the sugar ring and their use for the preparation of oligonucleotides containing aliphatic amino groups” United States Patent Number 4,849,513 (filed June 1986). This reference discloses 5'-amino-5'-dexoythymidines having a nitrogen protecting group of 9-fluorenylmethyloxy carbonyl.
- G. Alvarado Urbina *et al.*, “Direct immobilization of oligonucleotides on polymer supports. Use of Fmoc derivative in DNA/RNA synthesis. Methods for using immobilized oligonucleotides.” Innovations and Perspective in Solid Phase Synthesis and Combinatorial Libraries, 2000, Editor Roger Epton, Chapter 9, pp 37-42 (Date stamp March 20, 2002 British Library Document Supply Center). This reference is an Applicant publication but not prior art because the Applicant's pending application has a priority date of provisional application number 60/414,061 filed September 27, 2002.

This Information Disclosure Statement under 37 C.F.R. §§ 1.56 and 1.97 is not to be construed as a representation that a search has been made, that additional information material to the examination of this application does not exist, or that any one or more of these citations constitutes prior art.

Dated: 4/12/2007



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Serial No.: 10/670,015

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Use Several Sheets If Necessary)

Applicant: Gabriel Alvarado

(37 CFR § 1.98(b))

Filing Date: 09/24/2003

Group Art Unit: 1637

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Serial / Patent Number	Issue Date	Applicant / Patentee	Class	Subclass	Filing Date
	1	4,683,195	7/28/87	Mullis <i>et al.</i>	435	6	2/7/86
	2	4,683,202	7/28/87	Mullis <i>et al.</i>	435	91.2	10/25/85
	3	4,849,513	7/18/89	Smith <i>et al.</i>	536	26.6	6/24/86
	4	5,015,733	5/14/91	Smith <i>et al.</i>	536	27.23	12/19/88
	5	5,118,800	6/2/92	Smith <i>et al.</i>	536	23.1	2/27/91
	6	6,469,158	10/22/02	Usman <i>et al.</i>	536	25.4	5/2/95
	7	6,534,639	3/18/03	Manoharan <i>et al.</i>	536	23.1	7/7/00

OTHER DOCUMENTS (Including Author, Title, Date, Relevant Pages, Place of Publication)

8	Bergermann & Pfeleiderer, "The 2-dansylethoxycarbonyl (= 2-{[5-(dimethylamino)naphthalen-1-yl]sulfonyl}ethoxycarbonyl; Dnsceoc) group for protection of the 5'-hydroxy function in oligodeoxyribonucleotide synthesis," <i>Helvetica Chimica Acta</i> 77:203-2115 (1994)
9	Doty <i>et al.</i> , "Strand separation and specific recombination in deoxyribonucleic acids: physical chemical studies," <i>Proc. Natl. Acad. Sci. USA</i> 46:461-476 (1960)
10	Gaur <i>et al.</i> , Synthesis of 9-fluorenylmethoxycarbonyl (Fmoc) exocyclic amino protected deoxynucleosidephosphoramidites for oligonucleotide synthesis, <i>Indian Journal of Chemistry</i> 29B:108-112 (1990)
11	Marmur and Lane, "Strand separation and specific recombination in deoxyribonucleic acids: biological studies," <i>Proc. Natl. Acad. Sci. USA</i> 46:453-461 (1960)
12	Koole <i>et al.</i> , "Synthesis of phosphate-methylated DNA fragments using 9-fluorenylmethoxycarbonyl as transient base protection group," <i>J. Org. Chem.</i> , 54:1657-1664 (1989)
13	Seela and Wenzel, Oligodeoxyribonucleotides containing 4-aminobenzimidazole in place of adenine: Solid-phase synthesis and base pairing, <i>Helvetica Chimica Acta</i> 78, 833-846 (1995)
14	G. Alvarado Urbina <i>et al.</i> , "Direct immobilization of oligonucleotides on polymer supports. Use of FMOC derivative in DNA/RNA synthesis. Methods for using immobilized oligonucleotides." <i>Innovations and Perspective in Solid Phase Synthesis and Combinatorial Libraries</i> , 2000, Editor Roger Epton, Chapter 9, pp 37-42
15	Wallace <i>et al.</i> , "Application of synthetic oligonucleotides to the diagnosis of human genetic diseases," <i>Biochimie</i> 67:755-762 (1985)

Examiner:

Date Considered:

EXAMINER:

Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.